

Claims:

1. A method of forming a moulding by multiple
5 injection moulding, said method comprising injecting a first material into a mould, injecting at least a second material into said mould behind said first material so that said first material covers a surface of said mould, wherein at least one of said materials includes magnetic
10 particles, applying one or more magnetic fields to at least a portion of at least one of said materials so as to change the orientation and/or distribution of magnetic particles in at least one of said materials.
- 15 2. A method as claimed in claim 1, wherein said second material is injected into said mould before said first material has cured completely.
3. A method as claimed in claim 1 or 2, wherein at
20 least a third material is injected into said mould after said second material is injected.
4. A method as claimed in claim 3, wherein said third material is injected into said mould before said second
25 material has cured completely.
5. A method as claimed in any preceding claim, wherein said first and/or second and/or third material comprises magnetic particles.
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6. A method as claimed in any preceding claim, wherein said first and/or second and/or third material is substantially translucent or transparent.

7. A method of forming a moulding by injection moulding, said method comprising:

5 injecting a moulding material into a mould, said moulding material comprising magnetic particles; and applying one or more magnetic field to at least a portion of said moulding material so as to change the orientation and/or distribution of magnetic particles in said moulding material.

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8. A method as claimed in any preceding claim, wherein said magnetic fields orientate and/or distribute at least some of said magnetic particles substantially uniformly.

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9. A method as claimed in any preceding claim, wherein the strength of said magnetic fields is varied with time.

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10. A method as claimed in claim 9, wherein the strength of said magnetic fields is varied by varying the power delivered to one or more electromagnets with time.

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11. A method as claimed in any preceding claim, wherein the strength and/or location of said magnetic fields is varied with time by moving one or more permanent magnets or electromagnets relative to said mould.

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12. A method as claimed in any preceding claim, wherein said magnetic fields are applied in said mould before said at least one material has cured completely.

13. A method as claimed in any preceding claim, wherein said magnetic particles comprise nickel.

14. A method as claimed in claim 13, wherein said
5 magnetic particles comprise leafing grade nickel flakes.

15. A method as claimed in any preceding claim, wherein said magnetic particles comprise a core and an outer coating.

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16. A method as claimed in claim 15, wherein said core is a magnetic material.

17. A method as claimed in claim 15 or 16, wherein said
15 coating is aluminium, magnesium fluoride and aluminium or magnesium fluoride and a metal.

18. A method as claimed in any of claims 15, 16 or 17, wherein said coating is coloured.

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19. A method as claimed in any preceding claim, wherein said magnetic particles are highly reflective.

20. A method as claimed in any of claims 1-18, wherein
25 said magnetic particles are highly absorptive of light.

21. A method as claimed in any preceding claim, wherein said magnetic particles are substantially spherical.

30 22. A method as claimed in any of claims 1-20, wherein said magnetic particles have an elongated, non-spherical shape.

23. A method as claimed in any preceding claim, wherein said magnetic particles comprise 2-15% of the weight of at least one of said materials.
- 5 24. A method as claimed in claim 23, wherein said magnetic particles comprise 3-10% of the weight of at least one of said materials.
- 10 25. A method as claimed in claim 24, wherein said magnetic particles comprise about 5% of the weight of at least one of said materials.
- 15 26. A method as claimed in any of claims 1-22, wherein said magnetic particles comprise 0.1-15% of the weight of at least one of said materials.
- 20 27. A method as claimed in claim 26, wherein said magnetic particles comprise 0.5-10% of the weight of at least one of said materials.
- 25 28. A method as claimed in claim 26, wherein said magnetic particles comprise 0.1-3% of the weight of at least one of said materials.
- 30 29. A method as claimed in claim 27, wherein said magnetic particles comprise about 2% of the weight of at least one of said materials.
- 30 30. A method as claimed in claim 27, wherein said magnetic particles comprise about 3% of the weight of at least one of said materials.

31. A method as claimed in any of claims 1-6, wherein said first and/or second and/or third materials comprise different weight percentages of magnetic particles.
- 5 32. A method as claimed in any preceding claim, wherein at least one of said materials is injected into said mould whilst said mould is at an elevated temperature.
33. A method as claimed in claim 32, wherein said
10 temperature is in a range from 20 °C to 150 °C.
34. A method as claimed in any preceding claim, wherein said moulding is partially cured in said mould and is heated until completely cured after removal from said
15 mould.
35. A method as claimed in claim 34, wherein one or more further magnetic fields are applied to said moulding after it has been removed from said mould.
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36. A method as claimed in any preceding claim, wherein said one or more magnetic field changes the orientation and/or distribution of at least some of said magnetic particles in order to give a desired visual effect in at
25 least a part of the moulding.
37. A moulding apparatus comprising a mould, means for injecting a first material into said mould and means for injecting at least a second material into said mould,
30 wherein at least one of said materials comprises magnetic particles, a means for applying one or more magnetic fields in said mould so as to change the

orientation and/or distribution of magnetic particles in at least one of said materials.

38. An apparatus as claimed in claim 37, wherein said
5 means for providing one or more magnetic fields comprises one or more permanent magnetic and/or one or more electromagnets.

39. An apparatus as claimed in claim 38, wherein said
10 magnets and/or electromagnetics are provided in the walls of said mould.

40. An apparatus as claimed in claim 38 or 39, further comprising means for moving said magnets and/or
15 electromagnets relative to said mould.

41. An apparatus as claimed in any of claims 37-40, further comprising means for heating the inner surface of said mould.
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42. An apparatus as claimed in any of claims 37-41, wherein said mould has irregular and/or discontinuous inner surfaces.

25 43. An apparatus as claimed in any of claims 37-42, wherein said at least one moulding material is delivered to said mould by an extruder.

44. A moulding apparatus comprising:
30 a mould and means for injecting a moulding material into said mould, wherein said moulding material comprises magnetic particles; and

means for applying one or more magnetic fields in said mould so as to change the orientation and/or distribution of magnetic particles in said moulding material.

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45. An apparatus as claimed in any of claims 37-44, wherein said means for applying one or more magnetic fields is arranged so that the orientation and/or distribution of at least some of said magnetic particles is changed in order to give a desired visual effect in a part of the moulding.

46. An article formed by injection moulding, said article comprising at least a first material comprising magnetic particles, wherein the orientation and/or distribution of at least some of said magnetic particles has been changed by one or more magnetic field in order to give a desired visual effect in a part of the article.

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47. A mould for injection moulding plastics, said mould having one or more openings receiving a non-magnetic insert, said non-magnetic insert comprising a magnetic insert.

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48. A mould as claimed in claim 47, wherein said non-magnetic insert is copper.

49. A mould as claimed in claim 47 or 48, wherein said magnetic insert is a sintered ferrite magnet.

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